REMARKS

The McAninch 026 Patent teaches purging and then acquiring data at all wavelengths of interest. It is silent regarding acquiring data during a purge procedure, which is the focal point of the present invention method. The focus in McAninch 026 is on providing a system which allows very quick purging, as evidenced by the Finite-element analysis results reported therein which identify optimum system geometry to quickly effect purging. In contrast, the present invention Methodology does not consider reducing evacuating or purging time, (hereinafter purging used to imply either), but rather recognizes that during a relatively long purging period of most existing systems, data can be acquired at wavelengths which are not absorbed by water vapor and/or oxygen. The entire focuses and purposes of the inventions in McAninch and the present Application, are therefore seen to be very different.

Applicant recognizes that it is known to acquire data in non-purged environments at wavelengths which are not absorbed by water vapor and/or oxygen, and it is known to acquire data at wavelengths which are so absorbed in a purged environment. What Applicant has invented is not, as in McAninch, a system to reduce purge time, but rather a method for eliminating the necessity to waste a relatively longer purge time demonstrated by an existing system. Rather than simply wait until a realtivley long purge time is completed, the present invention method provides that a researcher acquire data at wavelengths which are not significantly affected by water vapor and/or oxygen, and then, once purging is sufficiently complete, finish-up acquiring data at wavelengths which are absorbed by water vapor and/or oxygen.

The Specification in McAninch 026 provides many instances of emphasising the benefit of using a system that enables short purging times, and provides a detailed description of the system McAninch invented to enable such. However, a look at the Method Claims in McAnanich 026 shows that a sample is not illuminated with any wavelengths until after purging is completed. See Claim 13 for instance. It is not until the last steps that a sample is illuminated, after purging is complete. This is what would be expected in the mind-set of McAninch, which emphasises the benefit of fast purge times. There would be no reason at all for McAninch to have considered how avoid a researcher wasting a necessary long period of purge time, as the focus of the 026 Patent invention is to minimize the purge time. See Col. 5 Lines 41-49 of McAninch, where it states:

> The O2 concentration is reduced to below 20 ppm within 10 sec.

With such a short purge time, the problem solved by the present invention simply does not present. A researcher can wait 10 seconds to begin acquiring data without inconvenince. But where conventional systems are used, the purge time can literally be on the order of an hour mor os less. A researcher wating for purging to be complete for an hour does represent a waste of time. The present invention recognizes this and teaches that during the purging process said researcher can tend to acquiring data at wavelengths which are not absorbed by components which absorb other wavelengths. The problem of overcoming a researcher wasting long periods of time while purging is tended-to is the focus of the present invention method, but said problem is simply not a concern in the context of McAninch 026 as the focus therein is making purging times very short. The focus in McAninch 026 is to eliminate the existence of long purge times, hence the problem illuminated and solved by the present invention simply does not exist in the setting of an application of a McAninch 026 system.

For the foregoing reasons it is forwarded that McAninch had no reason to consider the problem solved by the present invention method, as a 10 second purge period is very short. McAninch 026 simply sidesteps the problem identified and solved by the present invention methodology of avoiding wasting upwards of an hour or more. Existing systems which do not incorporate the McAninch system, do present the problem to researchers of wasted purging time. Importantly, the present invention provides a sequence of steps which mitigates the wasting of long purging times in existing systems, and said steps sequence is specific about what wavelengths to apply during and after a purge procedure.

Some Claims, (eg. Claim 1), are Amended to make the identified distinction more clearly presented. Note that said progression of steps was clear in Original Claims, (eg. see the express order of Claim 7 steps c) and d)).

As for the specific citations offered by the Examiner:

Col. 1, Lines 20 - 44 state, after the BACKGOUND title:

> The semiconductor industry is presently developing photolithographic methods utilizing 157 nm wavelength laser light as the next step in the continuing reducetion of device length scales. Metrology tools are presently needed to support this development, for instance by providing measurements of the optical properties of candidate materials over the spectral range from -140 to 200 nm. These

> wavelengths lie within a region known as the vacuum ultraviolet (VUV), in which the high absorbtion coefficients of oxygen and water vapor lower the attenuation length in standard air to fractions of a milimeter. (Historically, this light could only be observed under vacuum conditions, hence the designation). Achieving the transmission and stability necessary for VUV optical metrologytool, in which the optical paths are 0.5-2 m, therefore requires oxygen and water concentrations in the low parts-per-million (PPM) range averaged over the entire optical path. In the near future, as production facilities incorporating 157 nm lithography come online, larger numbers of tools---capable of handling production line throughput---will be required.

It is not understood how said language obviates the method of the present invention, or even how the system of the present invention is obviated thereby. Said language simply identifies a problem.

Col. 1 Lines 50-54 state:

> At present, multiple commercial manufacturers offer VUV spectroscopic ellipsometry products that maintain a controlled ambient via housing the entire metrology apparatus inside a sealed container filled (purged) with purified gas.

It is not understood how said language obviates the method of the present invention.

As for Figs. 1, 2 and 3, they show the McAninch system, which is designed to decrease purging time, therefore making the method of the present invention unnecessary.

It is not believed necessary to specifically address the

Examiner's arguments regarding Claims which describe the electromagnetic radiation polarization, as such does not address the inventive method step of the present invention.

As regards Claim 7 steps c) and d), the Examiner identifies Col. 3 line 19 and Col. 5 Lines 1 - 10:

Col. 5, line 19 states:

> Fig. 1 depicts a cross sectional view of an optical metrology system 20 that implements a preferred embodiment of the inventive gas-purge system.

and Col. 5 lines 1 - 10 state:

> .... The intent of the model was to permit a parametric study of flow system performance as a function of the design variables assessing the temporal evolution and temporal stability of chemical purity, flow geometry, and gas temperature as a function of boundary shape and flow rate. The stability against pertubations, time required for initial purge, time scales for recovery from wafer exchange, and the variation in system performance as a function of wafer position (wafer edge exclusion) were determined.

Again, this language says nothing about the present invention method but rather documents that the focus of the 026 Patent was to provide a system which is purged quickly. As stated above, where a purge is accomplished quickly the problem solved by the present invention does not present. This language teaches away from even identifying the problem solved by the present invention.

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It is believed that the Claims are now in Form for Allowance, therefor the Examiner is respectfully requested to provide Notice of Allowance and Issue Fee due. Should problems remain Applicant is open to Examiner suggestion and Amendment.

Sincerely,

JAMES D. WELCH
JW/hs